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Indian Standard

SPECIFICATION FOR SHIP'S ORDINARY RECTANGULAR WINDOWS

PART II GENERAL REQUIREMENTS

UDC 629·12·011·83

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 5.00 Gr 3

December 1978

Indian Standard
SPECIFICATION FOR SHIP'S ORDINARY RECTANGULAR WINDOWS
PART II GENERAL REQUIREMENTS

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Indian Standard
SPECIFICATION FOR SHIP'S ORDINARY RECTANGULAR WINDOWS
PART II GENERAL REQUIREMENTS

0. FOREWORD

0.1 This Indian Standard (Part II) was adopted by the Indian Standards Institution on 31 July 1978, after the draft finalized by the Shipbuilding Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 This standard covering ship's ordinary rectangular windows is being issued in three parts. This part (Part II) covers general requirements. Other parts in the series are as follows:

Part I Types and dimensions
Part III Positioning

0.3 This standard is based on ISO 3903-1977 Shipbuilding — Ships' ordinary rectangular windows, issued by the International Organization for Standardization (ISO).

1. SCOPE

1.1 This standard (Part II) covers general requirements, materials, construction, testing and designation of ship's ordinary rectangular windows.

2. GENERAL REQUIREMENTS

2.1 The rectangular windows shall be manufactured to the main dimensions given in IS : 8886 (Part I)-1978* in addition to the requirements specified in **3** and **4**.

2.2 The completed rectangular windows, main frames, glassholders and all other components shall be capable of meeting the test requirements specified in **5**.

3. MATERIAL

3.1 The main components of the window, that is, main frame, glassholder, and glass retaining frame shall be manufactured from the materials given in Table 1. The tensile strength and elongation of the material shall be as given in Table 2.

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*Specification for ship's ordinary rectangular windows: Part I Types and dimensions.

TABLE 1 MATERIAL CLASSES

(*Clause* 3.1)

<table>
<tr><th colspan="2" rowspan="2">MODEL OF WINDOW</th><th colspan="3">MATERIAL FOR</th><th rowspan="2">MATERIAL CLASS CODE NUMBER</th></tr>
<tr><th>Main Frame</th><th>Glassholder</th><th>Glass Retaining Frame</th></tr>
<tr><td rowspan="6">Opening</td><td>Bolted</td><td colspan="3">Brass</td><td>111</td></tr>
<tr><td>Bolted</td><td colspan="3">Aluminium alloy</td><td>333</td></tr>
<tr><td>Welded</td><td>Mild steel</td><td colspan="2">Brass</td><td>211</td></tr>
<tr><td>Welded</td><td colspan="2">Mild steel</td><td>Brass</td><td>221</td></tr>
<tr><td>Welded</td><td>Mild steel</td><td colspan="2">Aluminium alloy</td><td>233</td></tr>
<tr><td>Welded</td><td>Aluminium alloy (only wrought or extruded)</td><td colspan="2">Aluminium alloy</td><td>333</td></tr>
<tr><td rowspan="5">Non-opening</td><td rowspan="2">Bolted</td><td>Brass</td><td>—</td><td>Brass</td><td>101</td></tr>
<tr><td>Aluminium alloy</td><td>—</td><td>Aluminium alloy</td><td>303</td></tr>
<tr><td rowspan="3">Welded</td><td>Mild steel</td><td>—</td><td>Brass</td><td>201</td></tr>
<tr><td>Mild steel</td><td>—</td><td>Aluminium alloy</td><td>203</td></tr>
<tr><td>Aluminium alloy (only wrought or extruded)</td><td>—</td><td>Aluminium alloy</td><td>303</td></tr>
</table>

NOTE — The code numbers of the material class are a combination of numbers given in Table 3 and comprising main frame, glassholder and glass retaining frame in order.

TABLE 2 TENSILE STRENGTH AND ELONGATION

(*Clause* 3.1)

WINDOW TYPE	MATERIAL	MINIMUM TENSILE STRENGTH, N/mm²			MINIMUM ELONGATION, PERCENT
		Main Frame	Glassholder	Retaining Frame	
E	Aluminium alloy, brass, mild steel	180	180	180	10
F	Aluminium alloy, brass, mild steel	140	140	140	3

TABLE 3 MATERIAL CODE NUMBERS

(*Table* 1)

MATERIAL CODE NUMBER	MATERIAL
1	Cu-material (for example, brass)
2	Fe-material (for example, mild steel)
3	Al-material (cast or wrought alloy)
0	No components (for example, glassholder for non-opening windows)

3.1.1 The use of cast or wrought alloy is optional in case of brass and aluminium alloy and shall be as agreed to between the manufacturer and the purchaser of windows.

3.2 The material for closing devices and hinge pin shall be corrosion-resistant and shall not affect the corrosion-resistance of the other parts of the window.

3.2.1 For aluminium alloy windows, the closing device and hinge pin shall be made of non-corrosive steel, stainless steel or such alloys which are not likely to cause corrosion of windows, closing devices or pins. The tensile strength and elongation of the materials used for the closing device, hinge pin and nut shall be as given in Table 4.

TABLE 4 TENSILE STRENGTH AND ELONGATION

(*Clause* 3.2.1)

Window Type	Closing Device and Hinge Pin		Nut for Closing Device	
	Minimum Tensile Strength, N/mm²	Minimum Elongation, Percent	Minimum Tensile Strength, N/mm²	Minimum Elongation, Percent
	350	15	250	14
F	250	14	180	8

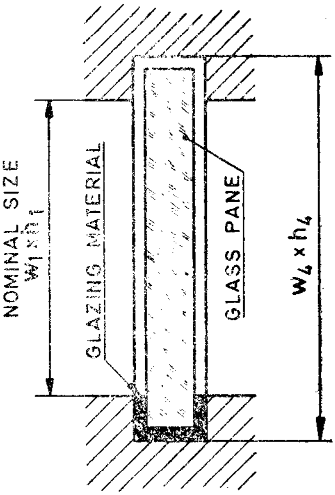
4. CONSTRUCTION

4.1 Glazing — The dimensions of the glass recess (w_4, h_4, r_4) in the glass holder of opening windows and in the main frame of non-opening windows shall be as given in Table 5.

TABLE 5 GLASS RECESS

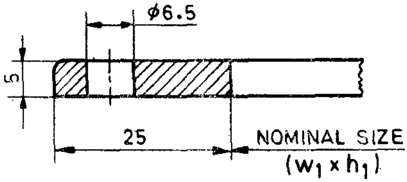
(All dimensions in millimetres)

Window			Glass Recess		
No.		Nominal Size			
Type		$w_1 \times h_1$	w_4	h_4	r_4
E	F				
1		300×425	321	446	60
2		355×500	376	521	60
3		400×560	421	581	60
4		450×630	471	651	110
5		500×710	521	731	110
6		560×800	581	821	110
7		900×630	921	651	110
8		1 000×710	1 021	731	110
—	9	1 100×800	1 121	821	110



Note — For main frames of welded non-opening windows, the dimensions h_4 and w_4 may be increased by 3 mm and the corner radius r_4 by 1·5 mm.

4.1.1 If a glass retaining frame is used for fixing the glass pane in the glassholder of opening windows or in the main frame of non-opening windows the minimum dimensions shall be as given in Fig. 1.



All dimensions in millimetres.

FIG. 1 GLASS RETAINING FRAME

4.1.2 The dimension of glazing screw shall be 6 mm with a pitch of 75 mm (*Max*) for Type E and 100 mm (*Max*) for Type F window.

4.1.3 When glazing, it is essential to centralize the glass pane in the glassholder of opening windows or in the main frame of non-opening windows so that there is clearance all round. The glazing material shall be as agreed to between the manufacturer and the purchaser.

4.2 Glass Panes — Toughened safety glass panes according to IS : 6640-1972* shall be used. The nominal sizes of the glass pane shall correspond to the nominal sizes of the windows.

4.3 Fasteners (Closing Devices) — The minimum number of fasteners comprising closing devices for glassholder of Types E and F opening rectangular windows shall be as given in Tables 4 to 9 of IS : 8886 (Part I) - 1978 †. The total number of fasteners and their construction shall be such that the window ensures a sufficient stiffness and watertightness according to **5**.

4.4 Hinges — The hinges shall be provided with round holes. The number of hinges shall depend on the kind of window, that is, type, model, size and construction, but shall be at least two.

4.5 Closing Devices — At least two closing devices shall be used and in continuation an appropriate screw locking device shall be provided in case of outward opening windows to ensure that the closing device does not strike the glass pane.

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*Specification for toughened safety glasses for ship's windows.

†Specification for ship's ordinary rectangular windows : Part I Types and dimensions.

4.6 Gaskets for Glassholder

4.6.1 The gaskets used for ensuring watertightness between the glassholder and the main frame shall be according to IS : 8809-1978*.

4.6.2 The gaskets shall be secured in grooves by suitable adhesive.

4.7 Height of Spigot — The minimum height of spigot shall be calculated as follows:

Height of spigot = thickness of shell plating plus thickness of gasket between shell plating and main frame plus 2 mm.

4.7.1 Preferred values for the height of spigot of bolted windows are given in Tables 4, 6, 8, and 10 of IS : 8886 (Part I) - 1978†. In case these values are unsuitable the following values shall be used:

Type E	12 mm
Type F	19 mm

This shall be specially arranged while ordering the window.

4.8 Fixing Device — All sidewards opening windows shall be provided with a fitted fixing device such as a hook. This fixing device shall form the part of the window to be delivered.

5. TESTING

5.1 Watertightness Test — To ensure that the windows and packing are watertight when fitted, the hose test shall be carried out by the shipbuilders to the satisfaction of the owners or surveyor's representative. The test shall consist of hosing the window by means of at least 16 mm nominal size hose held approximately 2·5 to 3 m from the window with a water pressure of 2 bar for a maximum period of 3 minutes.

5.2 An equivalent hydraulic test shall be carried out by the manufacturer of windows before despatch with about 10 percent of the lot to be delivered to a minimum of one window.

5.3 Mechanical Strength Test — The manufacturer of windows shall guarantee sufficient mechanical strength of the window. At the request of the purchaser he shall ensure that the materials used conform to the strength values as prescribed in **3**.

5.3.1 The mechanical testing of the materials shall be carried out in accordance with the methods prescribed in IS : 1608-1972‡ and IS : 1816-1961§ as applicable to relevant material.

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*Gaskets for ship's rectangular windows.

†Specification for ship's ordinary rectangular windows : Part I Types and dimensions.

‡Method for tensile testing of steel products (*first revision*).

§Method for tensile test for light metals and their alloys.

6. DESIGNATION

6.1 Windows conforming to this standard shall be designated by the following information in the order given below:

a) Type E or F,
b) Window number,
c) Model,
d) Material class, and
e) Number of the standard.

Example:

The designation of ship's rectangular window heavy type (E), window number 4, nominal size 450 × 630, side window, inwards left-hand opening, bolted model (ILB), material class 111 shall be designated as follows:

E 4 ILB — 111 window IS : 8886 (Part II)

7. MARKING

7.1 The windows shall be marked with the following information:

a) Type of window, that is, E or F;
b) Nominal size; and
c) Manufacturer's name or trade-mark.

7.1.1 The windows may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Conversion*
Force	newton	N	1 N = 0·101 972 kgf
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2